Identification of Mitigation Sites Through Watershed Characterization

Introduction:

WSDOT has participated in a variety of watershed-based programs during the last decade. These have included working in cooperation with other state and local agencies and planning groups to provide watershed-scale technical support, partnering with local agencies in environmental restoration, reach analysis of environmental impacts of highways, etc. More recently, WSDOT began implementing a more formal, scientific approach to watershed assessment.

This effort is based in WSDOT's desire to provide more environmentally responsible mitigation that is at the same time more cost-effective. Additional impetus and direction was given by the Transportation Efficiency and Accountability Committee or "TPEAC," a committee created by the Environmental Permit Streamlining Act. TPEAC's Watershed-Based Mitigation Subcommittee was charged with formalizing and testing a methodology that focuses on increasing environmental benefits, reducing mitigation costs, and enhancing the public participation process through the use of comprehensive watershed characterization to help identify potential mitigation opportunities.

The Methodology:

The watershed characterization methodologies that are being developed seek a more complete understanding of project effects, assess the condition of surrounding natural resources, and identify potential mitigation options that have the greatest opportunity for maximizing environmental benefit while reducing mitigation cost. A set of guiding principles directs methodology development. To maximize environmental benefit, the efforts focus on the recovery of ecosystem processes. In Western Washington, key ecological processes are assumed to be the delivery and routing of water, sediment, pollutants, large wood, heat, and habitat integrity/connectivity.

Understanding the effects of transportation and surrounding land use impacts on ecological processes requires the formation of an interdisciplinary technical team containing (at a minimum) a hydrologist, a hydrogeologist, an ecologist, a biologist, and a water quality specialist. This team must have access to Geographical Information Systems (GIS) staff, tools, and spatial data.

Communicating with local governments and local watershed planning efforts early in the assessment process creates additional opportunities for the collection of locally developed data. Additionally, locally determined recovery priorities will be used for mitigation when they satisfy mitigation needs and fall within targeted recovery areas.

While the timing of this process has some built-in flexibility, it is intended to occur during early stages of project planning. WSDOT envisions that it would be applied where major mitigation challenges were projected for large (and/or multiple) planned transportation projects in a watershed. Early testing of the methodology on State Route 522 demonstrated potential to provide significant benefits to the environment while reducing mitigation costs and strengthening environmental documentation and the public participation process. Ongoing tests in the North Renton section of Interstate 405 will allow further refinement of the methodology and will be evaluated for effectiveness.

The new methodology is generating interest from local governments, other state agencies, other states, and the federal government. For details on the steps used in the draft methodology, see the outline in a separate attachment.

Testing the Methodology:

The new evaluation process and underlying assumptions were tested on a pilot project at SR 522 in Water Resource Inventory Area (WRIA) 7. The draft methodology and the results of this test are available for review on the Internet at:

http://www.wsdot.wa.gov/environment/streamlineact/watershed.htm

The SR 522 test gave valuable insight into the application of the methodology, the availability of data, and the time needed to complete steps. In addition, the value of early local coordination was emphasized despite a tight time frame. However, the test was done using a project with identified mitigation options, which meant that to some degree the final product of the test would be hypothetical. A real test of the effectiveness of the watershed characterization methodology was needed. This would be one in which the final product was a list of appropriate potential mitigation sites for a transportation project that was underway.

The Second Test:

Recognizing that Washington is a national leader in the development of watershed-based mitigation, the Federal Highway Administration provided funding for just such a real test of the system. Consequently, a second test of the methodology is now addressing potential impacts of the project to widen Interstate 405 between the Cedar River and the junction with Interstate 90 in the Lake Washington watershed. Unlike the pilot, this test is expected to produce a useable final project – a list of potential mitigation sites in the watersheds of the rivers and creeks that are impacted by the project.

The recommended potential mitigation is expected to include a combination of sites identified using the watershed methodology, conventional sites, and the introduction of Low Impact Development (LID) methods.

Local coordination for the test has included early consultation with King County, the Muckleshoot Tribe, and the three cities that the project crosses, Bellevue, Newcastle, and Renton. Additionally, presentations have been made to the I-405 Steering Committee (mostly elected officials of governments on or near I-405) and the I-405 Technical Committee (local and state agency staff).

The test is well underway as this is written. A preliminary product, the list of potential mitigation sites, is expected by the end of September, 2003. A cost-benefit analysis of the proposed mitigation (compared to conventional mitigation) will follow by the end of 2003. The methodology document will also be updated based on the experience gained in conducting the second test.

The Future:

The current Watershed-Based Mitigation Subcommittee workplan calls for the technical team to use the methodology for at least three more transportation projects. The Subcommittee is concerning themselves with integrating watershed methodology into interagency policy. Developing Watershed Best Management Practices for stormwater that could be used “off the shelf” by transportation engineers and planners is also being considered.

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Watershed Methodology Outline

Methods Part I: Watershed Characterization

Step 1. Establish Spatial Scales of Analysis

Step 2. Establish Temporal Scales of Analysis

Step 3. Characterize Resource Condition and Process Drivers Within the Assessment Area

Step 4. Characterize Condition of Ecological Processes

Step 5. Interdisciplinary Integration

Step 6. Estimate Pre-project Cumulative Impacts of Land Use

Step 7. Step 3E. Establish Baseline Conditions for ESA Listed Species

Methods Part II. Project Site Assessment

Step 1. Establish In Right-of-Way Boundaries

Step 2. Engage Local Watershed Groups and Establish Recovery Themes

Step 3. Identify Potential Effects On Aquatic and Terrestrial Resources

Step 4. Identify Potential Effects On Special Species

Step 5. Estimate Direct Impacts to Regulated Resources

Step 6. Assess Functions Provided by Impacted Resources

Step 7. Estimate Stormwater Impacts of Project

Step 8. Identify Natural Resource Impacts to Avoid and/or Minimize

Step 9. Identify Direct and Indirect Impacts to ESA-listed Species

Step 10. Determine In Right-of-Way Potential to Mitigate Impacts

Step 11. Determine Need and Importance of In Right-of-Way Mitigation

Step 12. Determine if Potential In Right-of-Way Mitigation is Sustainable

Step 13. Estimate Out of Right-of-Way Mitigation Needs

Step 14. Convert Functions to Processes

Methods Part III: Identify And Assess Potential Sites

Step 1. Identify Target Landscape Areas

Step 2. Identify Local Priority Sites

Step 3. Identify Candidate Mitigation Sites

Step 4. Evaluate Site Potential Using Viability Screen

Step 5. Conduct Site-specific Function Assessment

Step 6. Least-cost Analysis of Candidate Sites

Step 7. Identify Viable Mitigation Options